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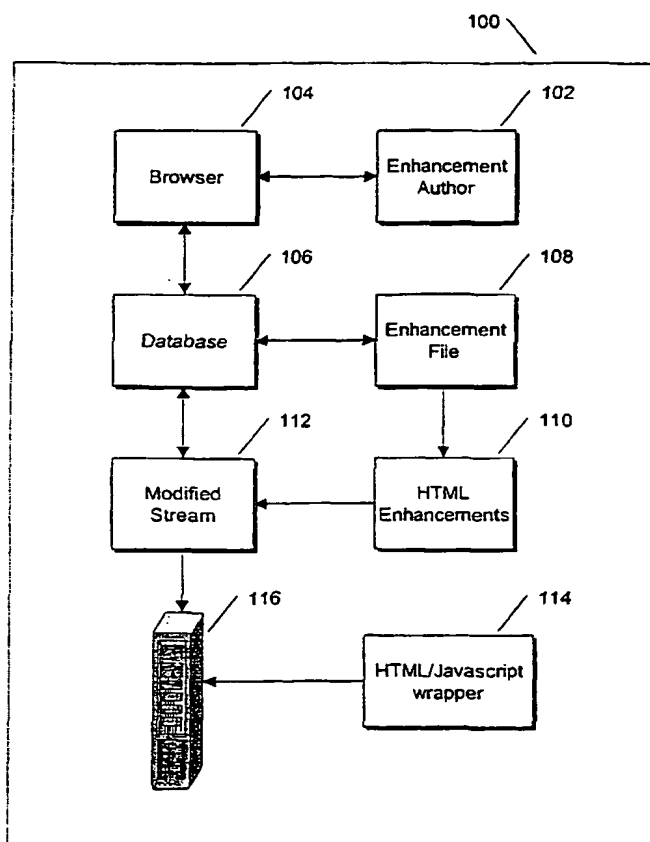
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[Continued on next page]

(54) Title: STREAMING MEDIA



(57) Abstract: A graphical user interface, providing local drag and drop functions, is employed to position text and graphic elements on a video frame image. Frame number, element position, and element attributes are employed to create an enhancement file. The enhancement file is employed to embed a trigger, comprising information that identifies a video frame to be enhanced and a locator indicating where enhancement information may be accessed, into a streaming media file to create an enhanced streaming media file. An HTML/Javascript page embeds a media player and includes software to detect a trigger, access enhancement information, and to render the enhancement information in response to the trigger.

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STREAMING MEDIA

Cross Reference to Related Applications

This application is based upon and claims priority of United States provisional application number 60/227,918 entitled "METHOD OF ENHANCING STREAMING MEDIA CONTENT," filed August 25, 2000 by Steve O. Markel, United States provisional application serial number 60/227,930, now United States patent applications serial number ____, entitled "SYSTEM AND METHOD FOR WEB BASED ENHANCED INTERACTIVE TELEVISION CONTENT PAGE LAYOUT," filed August 21, 2001; and United States provisional application serial number 60/227,063, now United States patent application serial number ____, entitled "SYSTEM AND METHOD FOR DISTRIBUTION OF INTERACTIVE CONTENT TO MULTIPLE TARGETED PRESENTATION PLATFORMS," filed August 23, 2001. All of these applications are specifically incorporated herein by reference for all that they disclose and teach.

Background

a. Field

The present disclosure relates to streaming media, such as video streams transferred across the Internet, and more particularly, to a method and system that produces enhanced content that may be employed with streaming media. This disclosure discusses system and method for distribution of interactive content to multiple targeted presentation platforms.

b. Description of the Background

Streaming media files, such as video and sound files, may be hosted at a web server, and then may be transmitted over the Internet or other network to a requesting user. A streaming media player, such as Microsoft Windows® Media Player, may be employed to play a media file within a user's browser. While the images that may comprise streaming media content may be similar in appearance to television, enhancement of streaming media exhibits a number of differences. Enhancement refers to

the display of elements such as text, graphics and images in conjunction with a video presentation. Display elements such as text, graphics, and images, for example, may be in proximity to a video image, or may overlay a video image. Display elements may also have links associated with them such that selection of the element, such as a displayed icon, or selection of the video area, may provide access to a web page, other information, or may launch another application. A prominent difference between television enhancement and enhancement of streaming media is that there are few tools and standards for streaming media enhancement, if any. In a manner similar to television, streaming media enhancements provide an opportunity for increased viewer satisfaction and also provide an opportunity for increased revenue through advertising, vendor association with a displayed product, and modification of advertising, such as local dealer information being displayed in conjunction with an advertisement. As such, a new method that provides a method and tools for streaming media enhancement is needed.

Summary of the Invention

The present invention overcomes the disadvantages and limitations of the prior art by providing a system and method for creating enhanced content for streaming media and for outputting an enhancement file suited to streaming media. The authoring tools of the present invention provides an easy to use visual interface that allows a user to open a streaming video file, position the video to a desired frame, and add text and graphic enhancements.

Commands employed to place the graphics and text enhancements are termed triggers. Each trigger uniquely specifies a text or graphic element, a location, and a time. A trigger may also contain an address where a graphic may be accessed. A text trigger may indicate font, font size, color and other attributes, plus location of where the text is displayed. Triggers may be grouped into a text file, using a scripting language such as XML for example, and then may be embedded into a streaming media file. The resultant enhanced streaming media file may be saved on a web server. In addition to the enhanced streaming media file, an HTML / JavaScript "wrapper" page is generated. The

HTML/Javascript page embeds a streaming media player object as well as the software code necessary to interpret the embedded triggers.

The invention therefore may comprise a method for creating an enhanced streaming media file comprising: defining a first window in a graphical user interface; displaying a streaming video file in a media player window contained in the first window; pausing the media player at one frame of a plurality of frames comprising the streaming video file; placing a displayable element at a position in the first window employing a pointing device and employing a drag and drop function responsive to an input from the pointing device, the drag and drop function implemented locally in the graphical user interface; creating an enhancement file containing information related to the displayable element, and the one frame; modifying a file containing a video stream to produce a modified video stream file containing a trigger comprising information that identifies a video frame to be enhanced and a locator indicating where enhancement information may be accessed; and embedding a media player and a software routine in a web displayable page wherein the media player is operable to display a video stream, and the software routine is operable to detect a trigger in the video stream, to access enhancement information employing a locator in the video stream, and to render enhancements defined by the enhancement information.

A user may access a web server with a browser and download the enhanced streaming media file and the HTML / JavaScript page. As the enhanced streaming media file plays, the wrapper HTML / JavaScript code interprets triggers contained in the enhanced streaming media file and renders the graphics or text elements. The invention may be implemented in a web browser, allowing remote editing and preview of enhancements.

The invention may further comprise a system for creating an enhanced streaming media file comprising: a computer; a web browser; a graphical user interface disposed in the browser; a streaming media player disposed in the graphical user interface; a first software program associated with the graphical user interface that allows a user to select a displayable element and to position the displayable element over an image displayed by the streaming media player, the first software program further provides a function to alter the position of the displayable element in response to input from a pointing device, the

function implemented locally in the graphical user interface; a second program that embeds information associated with the displayable element into a streaming media file; and a third program that produces a web displayable page that embeds a media player operable to display a video stream and a software routine that detects a trigger contained
5 in the video stream and that accesses enhancement information and renders an enhancement in response to the trigger.

Advantageously, the present invention allows easy enhancement of streaming video, providing lower cost for creating enhancements and providing new opportunities for increased viewer enjoyment, and for increased revenue generation through advertising
10 links, advertising customization, and interactive promotions.

Description of the Figures

In the figures,

15 Figure 1 depicts the functional environment of the present invention.

Figure 2 depicts a trigger management window.

Figure 3 depicts a trigger window with a selected video file and one enhancement element.

Figure 4 is a flowchart of a method for selecting an element in the video window.

20 Figure 5 is a flowchart of a method for moving and/or resizing an element in the video window of the trigger screen.

Figure 6 depicts a trigger window reflecting a second video time and an element at a second position.

Figure 7 depicts a third video time with text placed in the video window.

25 Figure 8 is a functional summary of one embodiment of the present invention.

Detailed Description of the Invention

30 Enhanced content is typically presented using a combination of HTML, JavaScript, Java and other web technologies. Presentation of enhanced content with

streaming media requires that enhanced content be authored, scheduled, previewed, and output to an enhanced streaming media file in a format suitable for web display.

Authoring comprises selection of elements such as text, graphics, and images and placement of the elements in relation to a displayed video image. Scheduling refers to specification of a time, video frame, or other indication, when enhancements may be displayed. Previewing enhancements may comprise accessing memory containing enhancement information, producing a file of enhancements and triggers, and employing a browser to view the enhancement. Alternately, enhancement information may be stored in a database and may be accessed to produce a file of enhancements and triggers. Output of an enhanced streaming media file may comprise inserting trigger information into a video stream and providing an HTML/Javascript wrapper page that embeds a streaming media player and includes software code to interpret the trigger information, access enhancement information and render enhancements.

Figure 1 depicts the functional environment of the present invention. Environment 100 comprises enhancement author 102 that operates with browser 104. As shall be shown in following figures, enhancement author 102 is employed to select display elements, place them in proximity to a video window, define the attributes of the elements, and define a time at which they may be rendered. Database 106 may store enhancement and project information. An enhancement file 108, that may be an XML script file, comprises element information including element attributes, position, and time. Enhancement file 108 may be processed to produce an HTML enhancements file 110 that may be imported into a streaming media file to produce modified stream 112. Modified stream 112 may then be stored in server 116 and may be accessed for transmission. In addition, an HTML/Javascript wrapper 114 may be created and stored in server 116.

Figure 2 depicts a trigger management window. Trigger window 200 may be accessed through URL 202. Trigger window 200 comprises video window 204 that displays streaming media images. A project may be selected or specified through project window 206. A streaming video file may be selected with load button 208. Once the video file is loaded, a frame for enhancement may be accessed employing play button 210. Play button 210, once selected, provides a pause function. Alternately, a frame may

be selected by entering a value in time window 212. Further, the controls of a media player (controls not depicted) may be employed to select a desired frame. Once a desired frame is selected, element window 214 may be employed to select a text or graphic element from a list of elements. Element window 214 provides a pull-down menu of elements. Browse button 216 allows selection of a directory where a text or graphic element may be accessed.

Figure 3 depicts a trigger window with a selected video file and one enhancement element. A video file has been opened and a display time selected. Video window 302 shows the video image that reflects the time shown in time window 304. Element 306, a target with arrow, has been placed in the upper left of the video image area. Information describing the time, position, and element are shown in trigger entry 308. When an element is selected through the element window, placement may employ manual entry of position information for the top left corner of the element through top window 310 and left window 312. The URL for the element may also be specified through URL window 314. Placement may also employ a mouse or other pointing device. A software routine downloaded to the browser, providing faster updates than a server-implemented routine, allows the user to drag an element to a desired position. Further, a resizing function may be implemented, allowing the user to alter the size of an element. Figures 4 and 5 depict flowcharts for selecting and moving or resizing an element.

Figure 4 is a flowchart of a method for selecting an element in the video window. Mouse select process 400 begins with a mousedown (button activation) at step 402. Step 404 determines if the mouse position is inside the video window when the button was activated. If the mouse position is outside the video window, mouse data is passed to other programs such as may be employed to select elements or play and pause the video stream. If the mouse position is inside the video window, step 406 determines if the position is inside the knobs of an element. Knobs are visual elements, such as small rectangles, for example, that are displayed at the edges of an element when selected. If the mouse is inside a knob, step 408 removes the knobs and the process ends at step 410. If step 406 determines that the mouse position is not inside a knob, step 412 determines if the mouse position is inside an element. If the mouse position is not inside an element, the process ends at step 414. If step 412 determines that the mouse position is inside an

element, step 416 obtains the element's x and y position, height, and width. Step 418 then determines if the user selected a different element. If a different element was selected, step 420 deselects the previous selection and the process sends at step 422. If the user did not select a difference element, the new element is selected at step 424 and the process ends at step 426.

Having selected an element displayed in the image area using the process of figure 4, a user may now move or resize the element. Figure 5 is a flowchart of a method for moving and/or resizing an element in the video window of the trigger screen. Move and resize process 500 begins with step 502 where a mousemove event is received. A mouse move event occurs when a mouse button is activated while the mouse is positioned over an element and the mouse is moved. Step 504 determines if the mouse is positioned over a resize knob displayed in conjunction with a selected element. If step 504 determines that the mouse position does not correspond to a knob, step 506 moves the element using mouse movement information. The size of the element is not altered and processing ends at step 508. If the position of the mouse corresponds to a knob of the element, step 510 checks if the knob corresponds to a west (left side) knob. If the west knob is selected, step 512 checks if the west knob is a lower left knob. If the knob is not the lower left knob, step 514 resizes the element by changing the left coordinates of the element and keeping the right edge position and height of the element unchanged. Processing then ends at step 516. If step 512 determines that a lower left knob is selected, step 518 adjusts the height and width of the element, maintaining the aspect ratio of the element and the position of the upper right corner of the element. Processing then ends at step 516. If step 510 determines that the west knob is not selected, step 520 checks if the east knob (right side) was selected. If the east knob is selected, step 522 checks if the east knob is an upper right knob. If the knob is not an upper right knob, step 524 resizes the element by changing the right coordinates of the element and keeping the left edge position and height of the element unchanged. Processing then ends at step 526. If step 522 determines that an upper right knob is selected, step 528 adjusts the height and width of the element, maintaining the aspect ratio of the element and the position of the lower left corner of the element. Processing then ends at step 526. If step 520 determines that an east knob is not selected, step 530 checks if a north knob is selected. If a north knob is

selected, step 532 checks if the upper left knob was selected. If the upper left knob was not selected, step 534 resizes the element by changing the top coordinates and keeping the bottom coordinates and width of the element unchanged. Processing then ends at step 536. If step 532 determines that the upper left knob was selected, step 538 adjusts the height and width of the element while maintaining the aspect ratio of the element and the position of the bottom right coordinate. Processing then ends at step 536. If step 530 determines that a north knob was not selected, step 540 checks if a lower right knob was selected. If a lower right knob was not selected, step 542 adjusts the height of the element, keep the width and top coordinates unchanged. Processing then ends at step 544. If step 540 determines that the knob is a lower right knob, step 546 adjusts the height and width of the element while maintaining the aspect ratio of the element and the position of the top left coordinate. Processing then ends at step 544. Appendix A lists code to implement the 'drag and drop' and 'resize' functions described in figure 4 and figure 5.

Figure 6 depicts a trigger window reflecting a second video time and an element at a second position. In figure 6 the video has been advanced to the time shown in time window 602. Employing the 'drag and drop' functions described in figure 4 and 5, the target with arrow element 604 has been moved to a position in the lower right of video window 606. Trigger entry 608 lists the time, position and element information for the newly positioned element.

Figure 7 depicts a third video time with text placed in the video window. In figure 7 the video has been advanced to the time shown in time window 702. Text 704, showing 'Caption Text', has been placed in video window 706. Trigger entry 708 lists the time, position and element information for the newly positioned text element. Font and type size are specified in trigger entry 708. A user may preview enhancements by selecting preview button 710. Preview mode creates an enhanced streaming media file and HTML/Javascript wrapper as previously described.

Figure 8 is a functional summary of one embodiment of the present invention. Steps 800 to 808 depict creation of an enhanced video stream. Steps 810 to 816 depict utilization of an enhanced video stream. At step 800, a video frame of a video file is selected. At step 802, enhancements are selected and positioned in one or more video frames. At step 804, a script containing triggers and element description is produced. At

step 806, the trigger script information is embedded in the video stream and an HTML/Javascript page is created. At step 808, the embedded video stream and HTML/Javascript page is stored in a server. At step 810, an enhanced stream is transferred across a network, which may be the Internet or other network, in response to a user selecting a URL or other locator containing the enhanced streaming video file. When the file is loaded, stream monitor 812 and trigger handler 814 are loaded to the viewer's system. Stream monitor 812 delivers streaming media to the user's media player while monitoring the stream for trigger information. When a trigger is found, trigger handler 814 may access a URL contained in the trigger to access enhancement information and then render the enhancements on media player 816.

Figure 8 depicts an embodiment where trigger information is embedded in the video stream, and an HTML/Javascript program interprets trigger information, including a locator such as a URL, to access enhancement information that is then rendered. In another embodiment, the embedded video stream may be modified to contain both triggers and enhancement information. In yet another embodiment, The HTML/Javascript page may be configured to monitor time information from a media player and to compare the time information with a list of trigger times contained in the HTML/Javascript page file, and to access and render enhancements when a listed trigger time occurs.

Embodiments that employ a locator to access enhancement information may also comprise pre-fetching of enhancement information to accommodate access latencies. One pre-fetch embodiment may employ a 'pre-trigger' that results in the enhancement information for an upcoming trigger to be accessed. Another pre-fetch embodiment may access information for a next trigger when a current trigger has been executed. Yet another pre-fetch embodiment may define a buffer, such as a FIFO, for example, and may access enhancement information in response to a FIFO pointer value.

The above-described authoring methods may employ a web browser such that users may remotely access the authoring and preview functions. The editing functions described provide a base set of capabilities. The elements selected through the element window 214 of figure 2 may include executable elements, such as animated sequences. Additional capabilities such as those described in the referenced application entitled

'SYSTEM AND METHOD FOR WEB BASED ENHANCED INTERACTIVE TELEVISION CONTENT PAGE LAYOUT' may be employed.

The foregoing description of the invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to
5 the precise form disclosed, and other modifications and variations may be possible in light in the above teachings. The embodiment was chosen and described in order to best explain the principles of the invention and its practical application to thereby enable others skilled in the art to best utilize the invention in various embodiments and various modifications as are suited to the particular use contemplated. It is intended that the
10 appended claims be construed to include other alternative embodiments of the invention except insofar as limited by the prior art.

APPENDIX A - CODE EXAMPLE FOR CLICK & DRAG TO PLACE ELEMENTS AND TO RESIZE THEM

Note: Numerical references shown in bold after "//" relate the section of code to a component of the figures. The figures are representative of the actions performed and may not reflect the exact order or functions performed.

```

function mouseDown()    //400
10 {
    //404: Was the MouseDown inside of the DivPg(Canvas) ?

    if ( event.x >= divPg.offsetLeft + divMain.offsetLeft
        && event.x <= divPg.offsetLeft - 0 + divPg.offsetWidth +
15 divMain.offsetLeft
        && event.y >= divPg.offsetTop + divMain.offsetTop
        && event.y <= divPg.offsetTop - 0 + divPg.offsetHeight +
divMain.offsetTop )
    {
20        // Yes.
        var el = event.srcElement;
        var pEl = el.parentElement;
        var i;
        var isText = false;

25        //406: Are we positioned inside a knob?

        if (el.id.indexOf("__knob", 0) == 0)
        {
30            // 408 Yes, we are on a knob, and the user wants to resize
            the element.
            initlX = event.clientX;
            initlY = event.clientY;

35            knob = el;
            hideKnobs();
            MouseDownOnElement = true;
        }
        else //412:
40        {
            while (true)
            {
                if (el.tagName == "BODY") return;
                if (pEl.tagName == "BODY") return;
45                if (pEl.tagName == "DIV" &&
pEl.id.indexOf("divEl")>=0) break;
                el = pEl;
                pEl = el.parentElement;
            }

50            if (el.tagName == "DIV")
            { // TEXT AREA
                ob = el.style;
            }
            else
55

```

```

        {
            ob = pEl.style;
        }
//416
5      initlX = event.clientX;
      initlY = event.clientY;

      initlObjX = ob.posLeft;
      initlObjY = ob.posTop;
10     elWidth = el.offsetWidth;
      elHeight = el.offsetHeight;
      elName = el.id;
      i = elName.slice(5);
15     //418: Did the user select a different element ?
      if (elementSelected == i)
      {
          MouseDownOnElement = true;
          // 420: Change to newly selected element
          elementSelected = i;
          selectElement(i);
          hideKnobs();
20     }
      else //424
      {
          var updated = true;
          //***** update display with selected element
          if (elementSelected > -1)
          {
30             updated = updEls(elementSelected);
          }

          if (updated)
          {
35             MouseDownOnElement = true;

            // Change to newly selected element
            elementSelected = i;
            selectElement(i);
            hideKnobs();
40         }
      }
    }
45 }

function mouseMove() //500
50 {
    if (MouseDownOnElement)
    {
        var fp = window.frmElProps;
        var pEl;
55        var elType;

        if (knob) //504

```

```

    {
        var e = eval("window.elImg" + elementSelected);
        elType = parseInt(elements[elementSelected][eElType]);
        if( elType == kElIsTA )
5          {
                pEl = e;
                e = e.style;
            }
            else
10          {
                pEl = e.parentElement;
            }

            var delta;
15          switch (knob.style.cursor)
            {
                case "w-resize":    //510
                {
                    delta = initlX - event.clientX;
20                    if(elType != kElIsTV)    //512
                    {
                        if (pEl.style.pixelLeft - delta <=
0)          //518
                        {
                            delta = pEl.style.pixelLeft;
25                            pEl.style.pixelLeft = 0;
                        }
                        else
                        {
30                            pEl.style.pixelLeft -= delta;
                        }
                    }
                    switch( elType )    //514
                    {
35                        case kElIsGraphic:
                        case kElIsBG:
                            e.width += delta;
                            break;
                        case kElIsTA:
40                            e.width =
Math.abs(parseInt(e.width) + delta) + "px";
                            break;
                        case kElIsTV:    //518
                            // Compute available WEST & South
45                            pixels
                            var Wpx = pEl.style.pixelLeft;
                            var Spx = gCanvasH -
                                (pEl.style.pixelTop + e.height);
50                            (gCanvasH/gCanvasW)*delta > Spx )
                            while( delta > Wpx ||
                            {
                                --delta;
                                if (delta == 0) break;
                            }
55                            pEl.style.pixelLeft -= delta;
                            e.width += delta;

```

```

        e.height = e.width
(gCanvasH/gCanvasW);
        break;
    default:
5         break;
    }
        break;
    }
    case "e-resize":    //520
10    {
        var w;
        delta = event.clientX - initlX;
        switch( elType ) //522
        {
15         case kElIsGraphic:    //524
            case kElIsBG:
                w = e.width + delta;
                if( pEl.style.pixelLeft + w >
20         gCanvasW )
                {
                    w = gCanvasW -
                    pEl.style.pixelLeft;
                }
                e.width = w;
                break;
25         case kElIsTA:    //524
            w = Math.abs(parseInt(e.width) +
            delta);
            if( pEl.style.pixelLeft + w >=
30         gCanvasW )
            {
                w = gCanvasW -
                pEl.style.pixelLeft;
            }
            e.width = w + "px";
            break;
35         case kElIsTV:    //528
            // Compute available EAST & South
            pixels
            var Epx = gCanvasW -
            (pEl.style.pixelLeft + e.width);
            var Spx = gCanvasH -
            (pEl.style.pixelTop + e.height);
            while( delta > Epx ||
45         (gCanvasH/gCanvasW)*delta > Spx )
            {
                --delta;
                if (delta == 0) break;
            }
            e.width += delta;
            e.height = e.width *
50         (gCanvasH/gCanvasW);
            break;
        default:
            break;
55    }
    break;

```



```

    }
    case "n-resize":    //530
    {
        var h;
        delta = initly - event.clientY;

5         if(elType != kElIsTV)    //532
        {
            if(pEl.style.pixelTop - delta < 0)
10            {
                delta = pEl.style.pixelTop;
                pEl.style.pixelTop = 0;
            }
            else
15            {
                pEl.style.pixelTop -= delta;
            }
        }

20        switch( elType )    //534
        {
            case kElIsGraphic:    //538
            case kElIsBG:
                e.height += delta;
                break;
25            case kElIsTA:    //538
                e.height =
Math.abs(parseInt(e.height) + delta) + "px";
                break;
30            case kElIsTV:
                // Compute available NORTH & West
pixels
                var Npx = pEl.style.pixelTop;
                var Wpx = gCanvasW -
35 (pEl.style.pixelLeft + e.width);
                while( delta > Npx ||
(gCanvasW/gCanvasH)*delta > Wpx )
                {
                    --delta;
40                    if (delta == 0) break;
                }
                pEl.style.pixelTop -= delta;
                e.height += delta;
                e.width = e.height *
45 (gCanvasW/gCanvasH);
                break;
            default:
                break;
        }
50        break;
    }
    case "s-resize":
    {
        var h;
55        delta = event.clientY - initly;
        switch( elType )    //540
        {

```

```

case kElIsGraphic: //542
case kElIsBG:
    h = e.height + delta;
    if( pEl.style.pixelTop + h >
5   gCanvasH )
    {
        h = gCanvasH -
        pEl.style.pixelTop;
    }
10   e.height = h;
    break;
case kElIsTA: //542
    h = Math.abs(parseInt(e.height) +
15   delta);
    if( pEl.style.pixelTop + h >
    gCanvasH )
    {
        h = (gCanvasH -
20   pEl.style.pixelTop);
    }
    e.height = h + "px";
    break;
case kElIsTV: //546
    // Compute available SOUTH & West
25   pixels
    var Wpx = gCanvasW -
    (pEl.style.pixelLeft + e.width);
    var Spx = gCanvasH -
    (pEl.style.pixelTop + e.height);
30   while( delta > Spx ||
    (gCanvasW/gCanvasH)*delta > Wpx )
    {
        --delta;
        if (delta == 0) break;
35   }
    e.height += delta;
    e.width = e.height *
    (gCanvasW/gCanvasH);
    break;
40   default:
    break;
    } // switch( elType )
    break;
    } // case s-resize:
45   } // switch( knob.style.cursor )

    var el = elements[elementSelected]; //506

    fp.txtLeft.value   = el[eElLeft]   = pEl.style.pixelLeft;
50   fp.txtTop.value    = el[eElTop]    = pEl.style.pixelTop;
    fp.txtWidth.value  = el[eElWidth]  = (elType == kElIsTA ?
    parseInt(e.width) : e.width);
    fp.txtHeight.value = el[eElHeight] = (elType == kElIsTA ?
    parseInt(e.height) : e.height);
55   }

    if (ob)

```

```
{
    if (ob.pixelLeft + event.clientX - initlX < 0)
        ob.pixelLeft = 0;
    else
5       ob.pixelLeft += event.clientX - initlX;

    if (ob.pixelLeft + elWidth + event.clientX - initlX >
window.divPg.clientWidth)
        ob.pixelLeft = window.divPg.clientWidth - elWidth;
10
    if (ob.pixelTop + event.clientY - initlY < 0)
        ob.pixelTop = 0;
    else
        ob.pixelTop += event.clientY - initlY;
15
    if (ob.pixelTop + elHeight + event.clientY - initlY >
window.divPg.clientHeight)
        ob.pixelTop = window.divPg.clientHeight - elHeight;

20    fp.txtLeft.value = elements[elementSelected][eElLeft] =
ob.pixelLeft;
    fp.txtTop.value = elements[elementSelected][eElTop] =
ob.pixelTop;
    }
25
    initlX = event.clientX;
    initlY = event.clientY;
}

30 return false;
}
```

Claims

What is claimed is:

1. A method for creating an enhanced streaming media file comprising:
defining a first window in a graphical user interface;
displaying a streaming video file in a media player window contained in
said first window;
5 pausing said media player at one frame of a plurality of frames comprising
said streaming video file;
placing a displayable element at a position in said first window employing
a pointing device and employing a drag and drop function responsive to an input from
said pointing device, said drag and drop function implemented locally in said
10 graphical user interface;
creating an enhancement file containing information related to said
displayable element, and said one frame;
modifying a file containing a video stream to produce a modified video
stream file containing a trigger comprising information that identifies a video frame
15 to be enhanced and a locator indicating where enhancement information may be
accessed; and
embedding a media player and a software routine in a web displayable
page wherein said media player is operable to display a video stream, and said
software routine is operable to detect a trigger in said video stream, to access
20 enhancement information employing a locator in said video stream, and to render
enhancements defined by said enhancement information.
2. The method of claim 1 wherein said step of embedding further comprises:
creating an HTML/Javascript web page containing said media player and
said software routine.
3. The method of claim 1 further comprising:

employing a resize function implemented locally in said graphical user interface to alter the size of said displayable element.

4. The method of claim 1 wherein said streaming media file further comprises:
a streaming media file conforming to Microsoft ASF format.
5. The method of claim 1 where said enhancement file further comprises:
an XML compliant script file.
6. The method of claim 1 further comprising:
employing a database to store information describing said displayable element, and said one frame.
7. The method of claim 1 further comprising:
saving said modified video stream file and said web displayable page on a server.
8. The method of claim 1 wherein a link is associated with said displayable element.
9. The method of claim 1 wherein said displayable element is an imported element.
10. An enhanced streaming media file created by the steps of:
defining a first window in a graphical user interface;
displaying a streaming video file in a media player window contained in said first window;
5 pausing said media player at one frame of a plurality of frames comprising said streaming video file;
placing a displayable element at a position in said first window employing a pointing device and employing a drag and drop function implemented locally in said graphical user interface;

10 creating an enhancement file containing information related to said
displayable element, and said one frame;

 modifying a file containing a video stream to produce a modified video
stream file containing a trigger comprising information that identifies a video frame
to be enhanced and a locator indicating where enhancement information may be
15 accessed; and

 embedding a media player and a software routine in a web displayable
page wherein said media player is operable to display a video stream, and said
software routine is operable to detect a trigger in said video stream, to access
enhancement information employing a locator in said video stream, and to render
20 enhancements defined by said enhancement information.

11. The enhanced streaming media file of claim 10 wherein said step of embedding
further comprises:

 creating an HTML/Javascript web page comprising said media player and
said software routine.

5 12. The streaming media file of claim 10 wherein said enhancement file is a text file.

13. The streaming media file of claim 10 further comprising the step of:

 saving said modified video stream file and said web displayable page on a
server.

14. The streaming media file of claim 10 wherein said enhancement file further
comprises:

 an XML compliant script file.

15. A system for creating an enhanced streaming media file comprising:

 a computer;

 a web browser;

 a graphical user interface disposed in said browser;

- 5 a streaming media player disposed in said graphical user interface;
 a first program associated with said graphical user interface that allows a
user to select a displayable element and to position said displayable element over
an image displayed by said streaming media player, said first software program
further provides a function to alter the position of said displayable element in
10 response to input from a pointing device, said function implemented locally in
said graphical user interface;
 a second program that embeds information associated with said
displayable element into a streaming media file; and
 a third program that produces a web displayable page that embeds a
15 media player operable to display a video stream and a software routine that
detects a trigger contained in said video stream and that accesses enhancement
information and renders an enhancement in response to said trigger.

16. The system of claim 15 further comprising:

 a preview function that employs said second program and said third
program to display an enhanced video stream on said web browser.

17. The system of claim 15 wherein said first program further comprises:

 a resize function implemented locally in said graphical user interface that
allows a user to alter the size of a displayed element.

18. The system of claim 15 further comprising:

 a database that stores said information associated with said element.

19. The system of claim 15 wherein said displayable element is an imported element.

20. The system of claim 15 where a link is associated with said displayable element.

21. The system of claim 15 wherein said third program further comprises:

an HTML/Javascript web page containing said media player and said software routine.

- 5 22. A system for embedding enhanced content such as graphics, text captions, and advertisement insertions in a streaming media file, comprising:
- a trigger management browser operative to pause said streaming media, permit enhancements to be placed on said media and to generate triggers indicative of said enhancements and embed said trigger in said streaming media file; and
- a host for receiving and storing said enhanced streaming media file for
- 10 transmission via the Internet to a requesting user;
- said system essentially as set out in the accompany description and Figures.

Figure 1

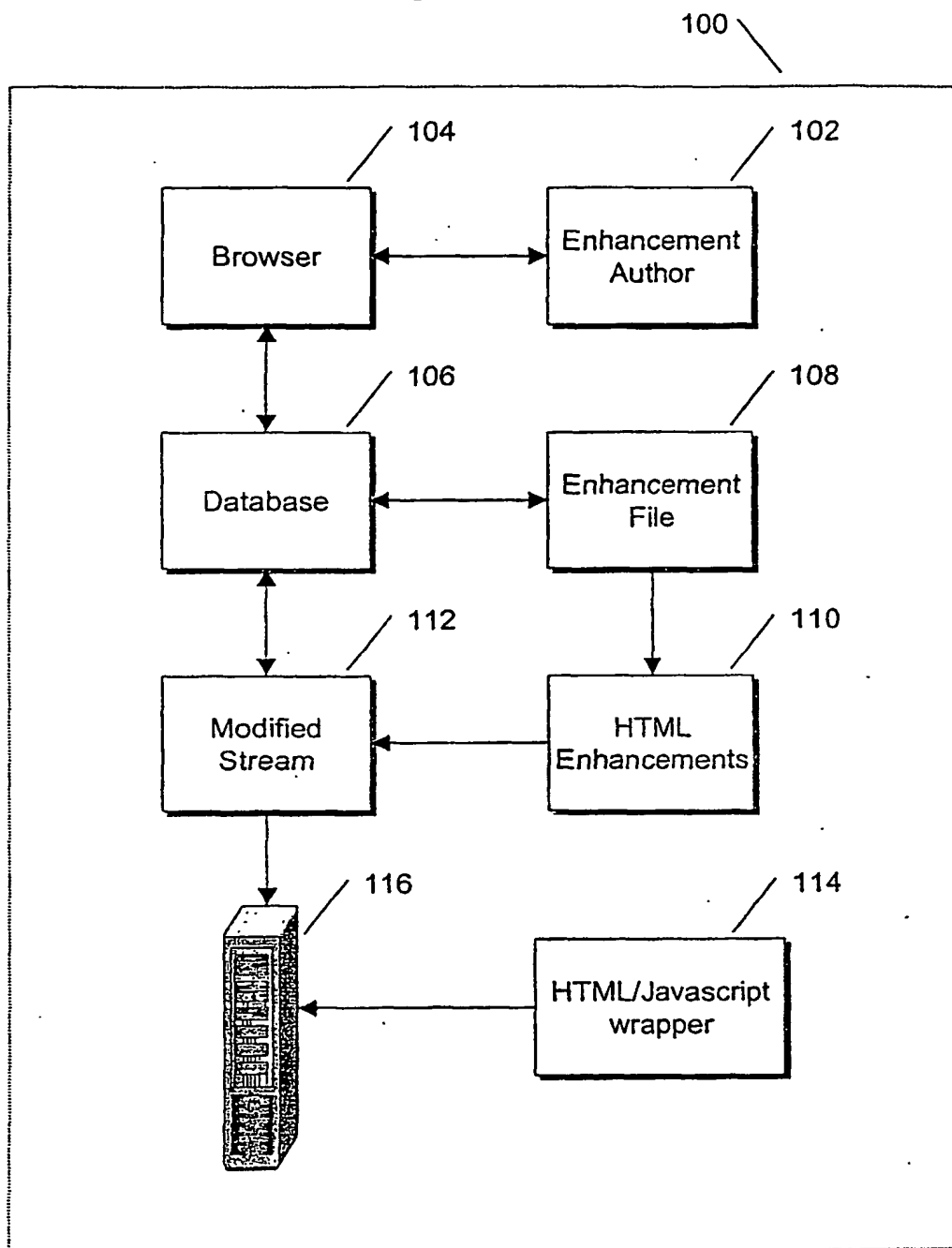


Figure 2

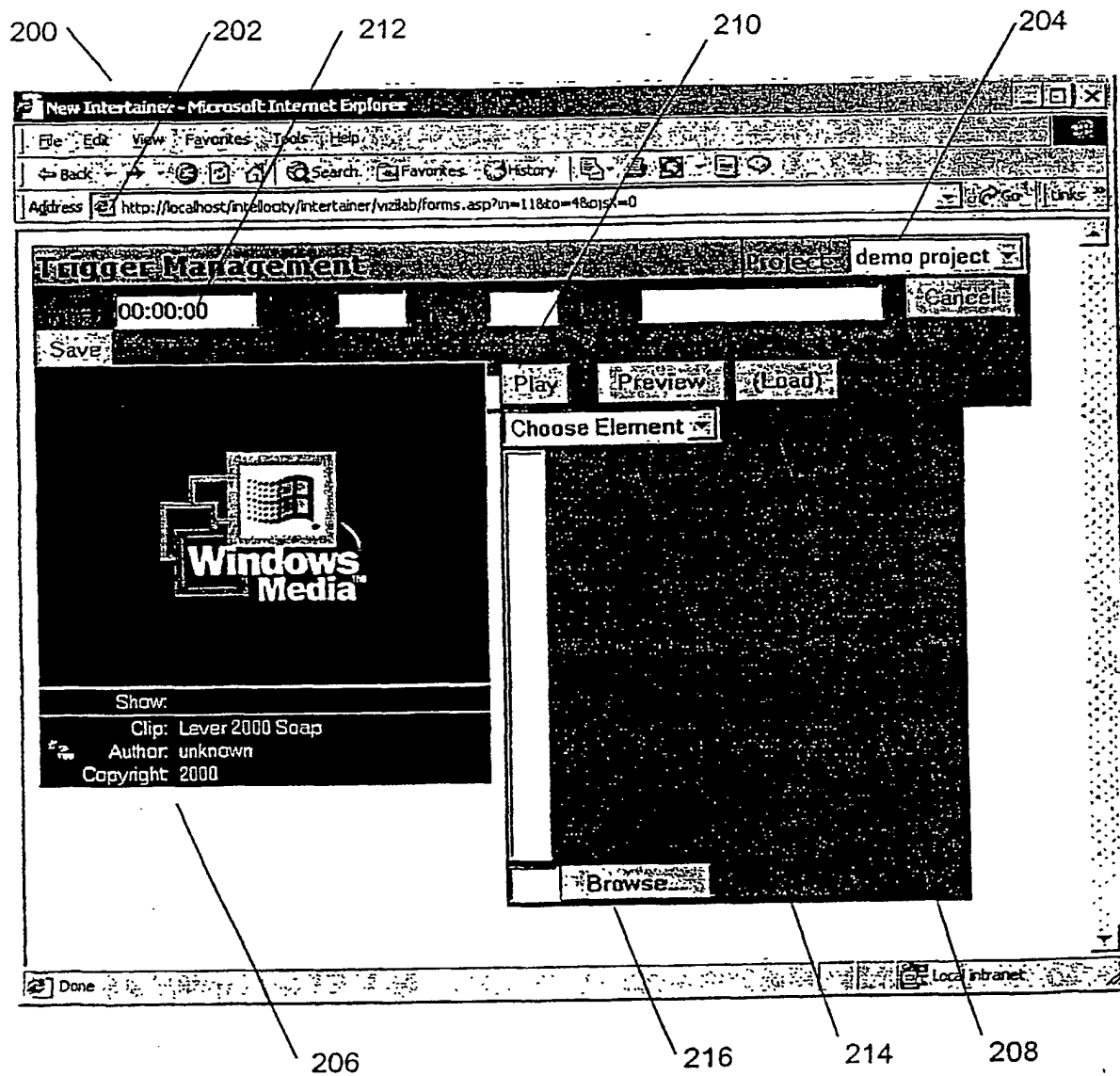


Figure 3

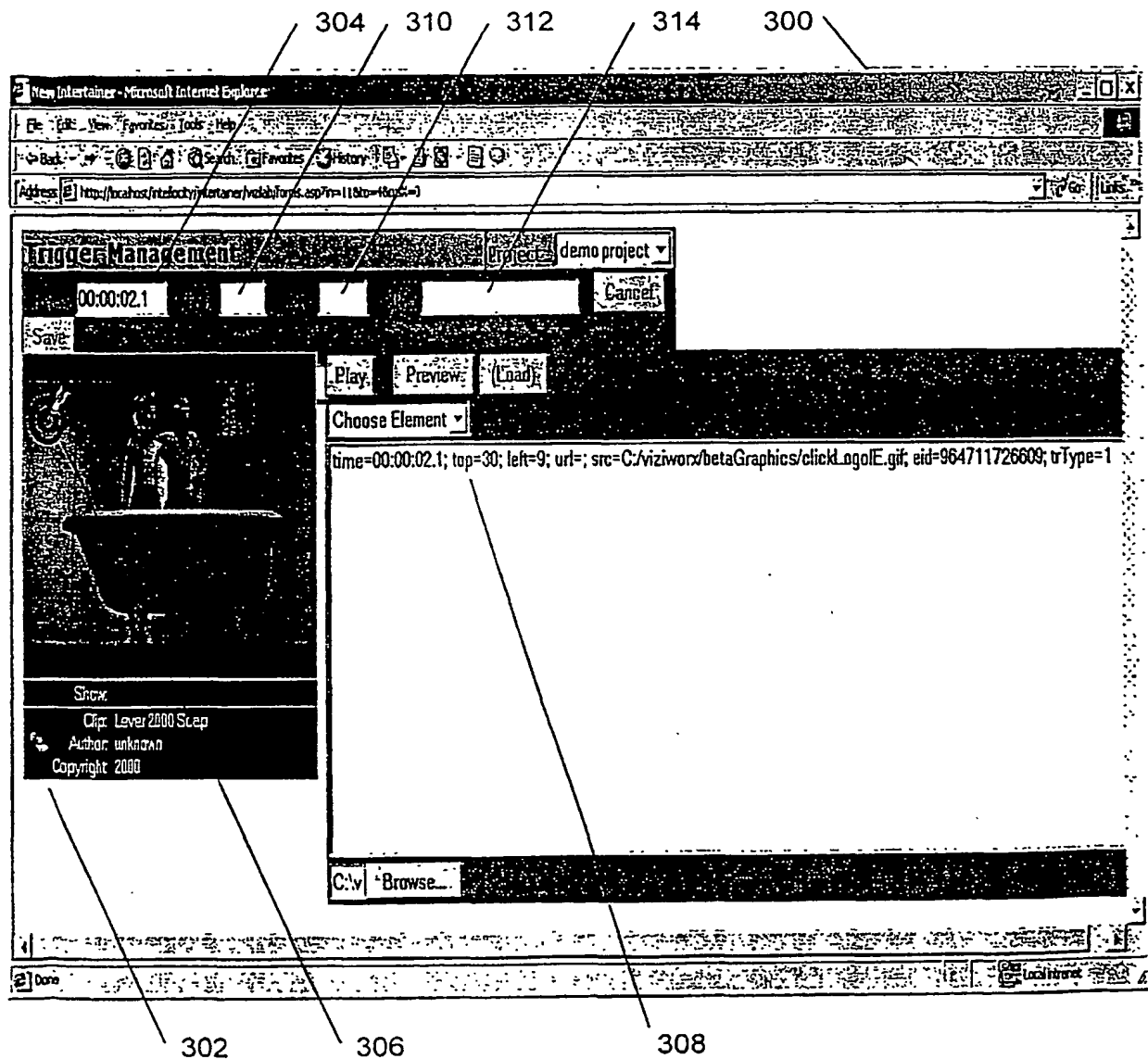


Figure 4

400

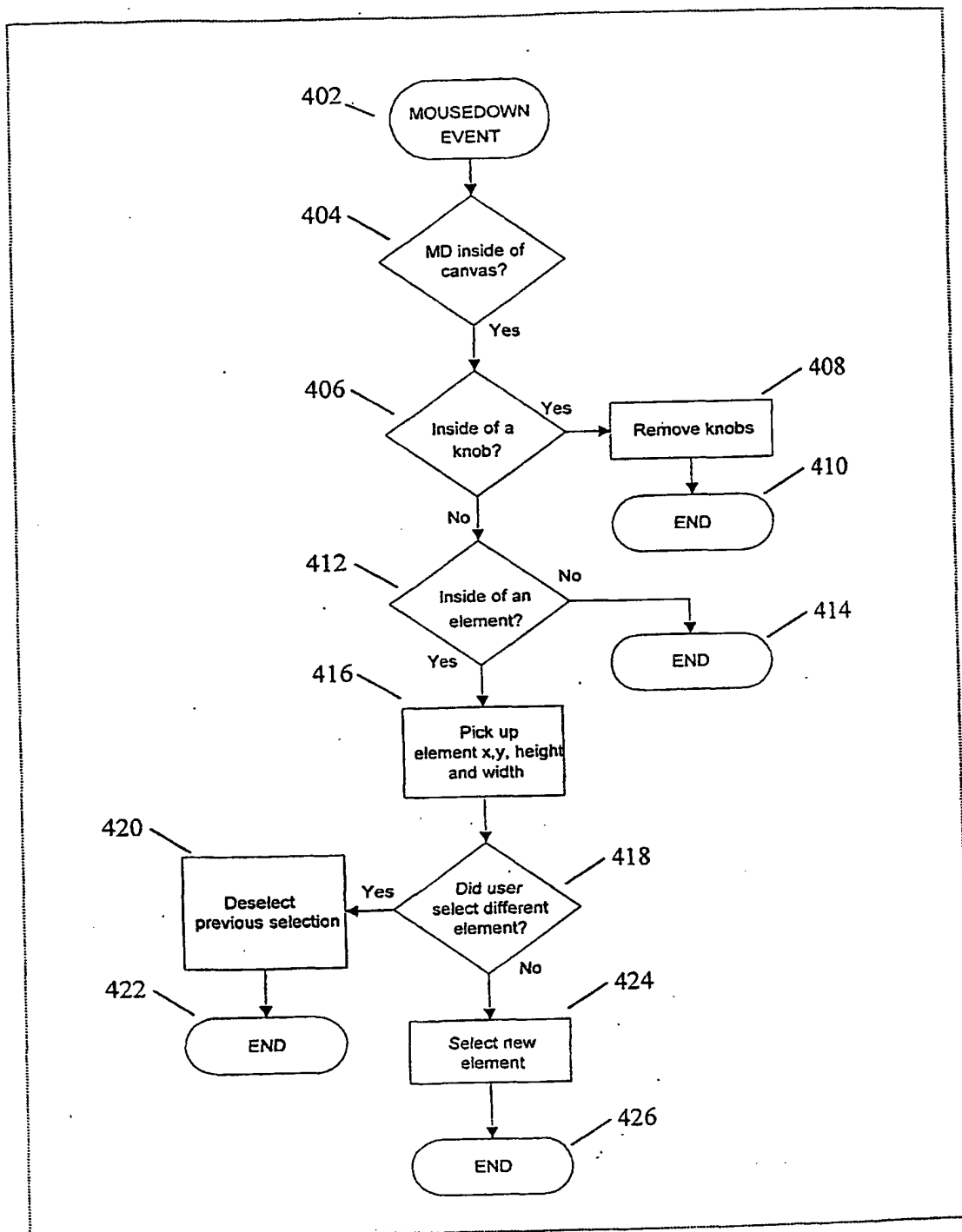


Figure 5

500

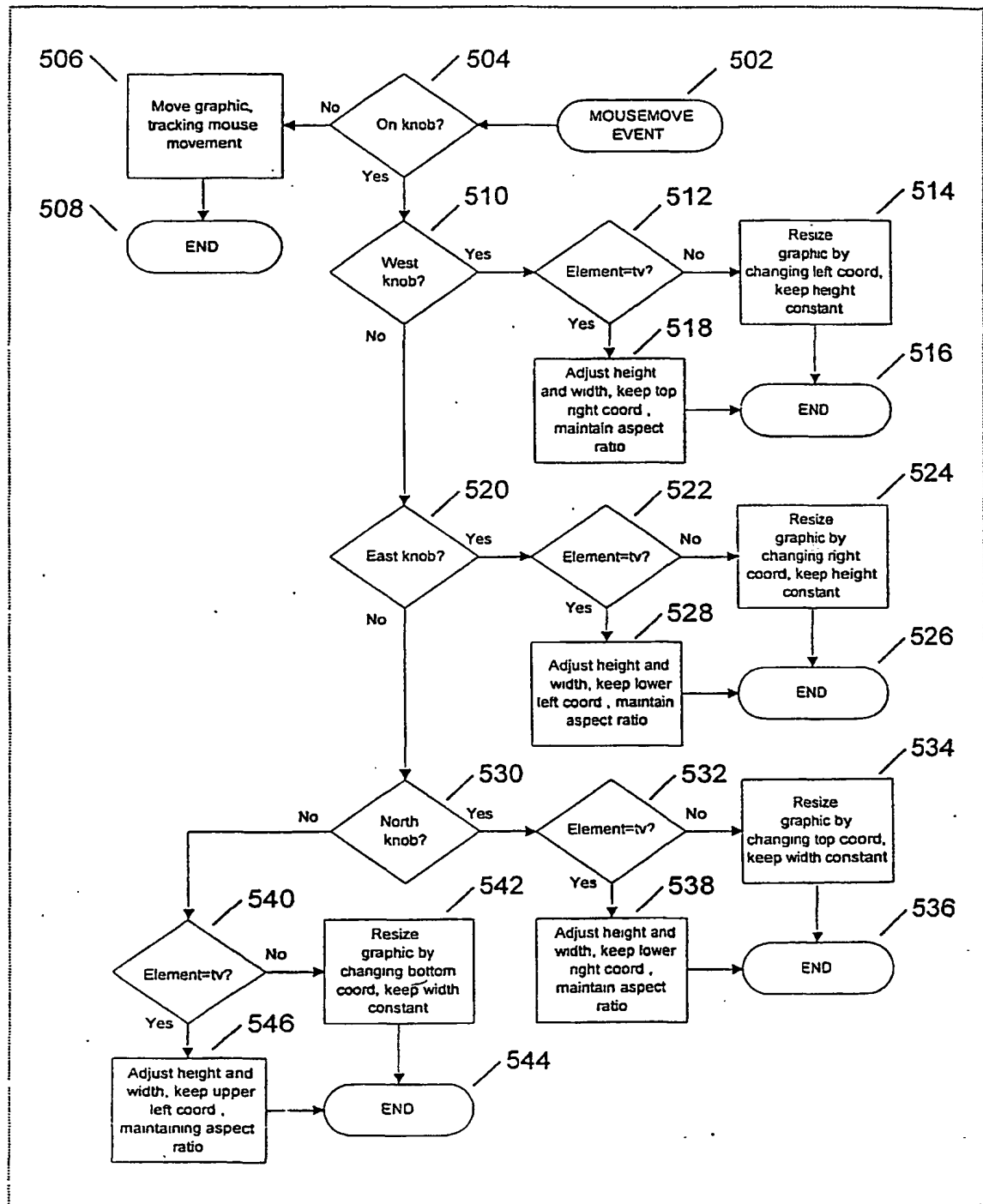


Figure 6

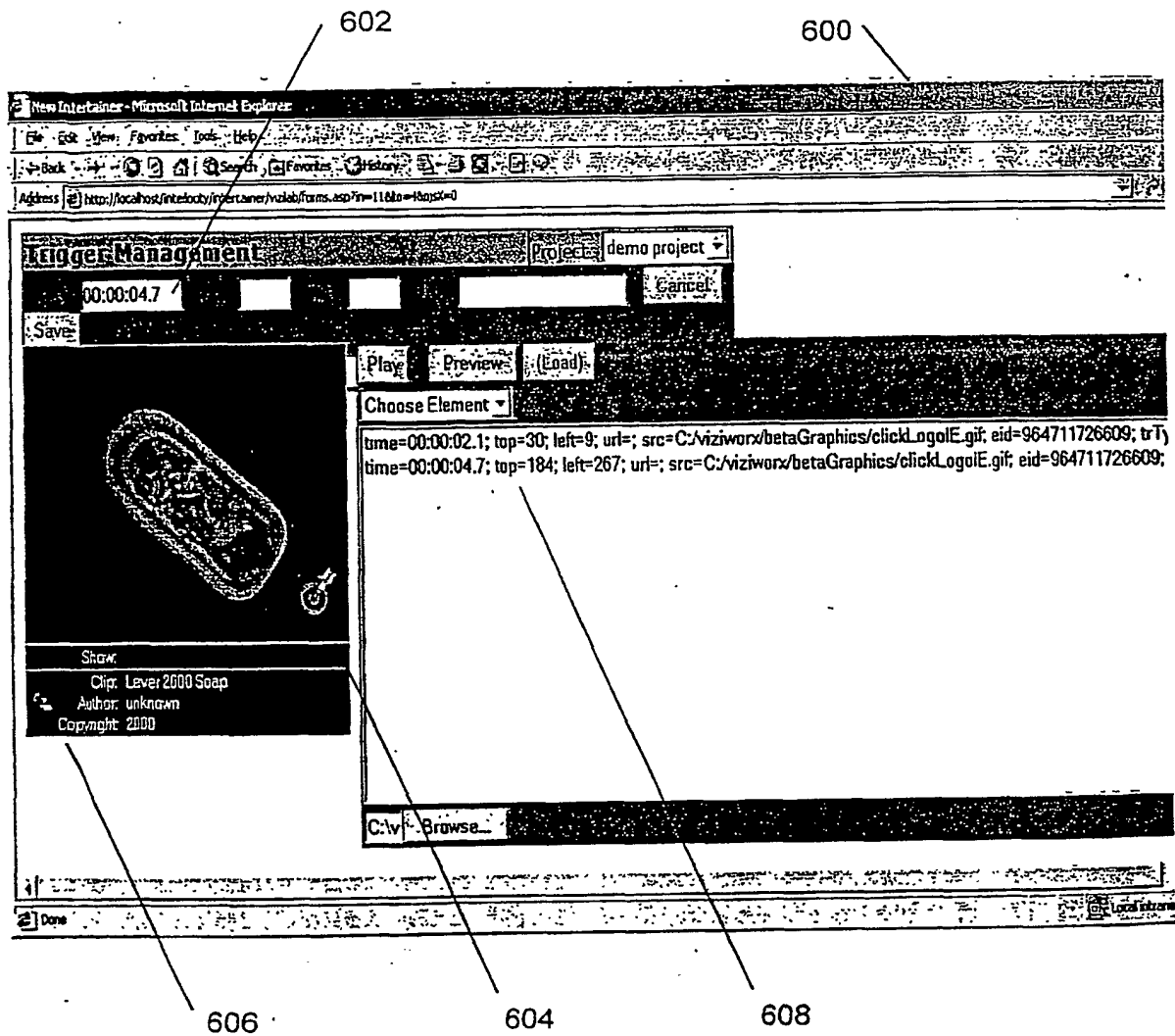


Figure 7

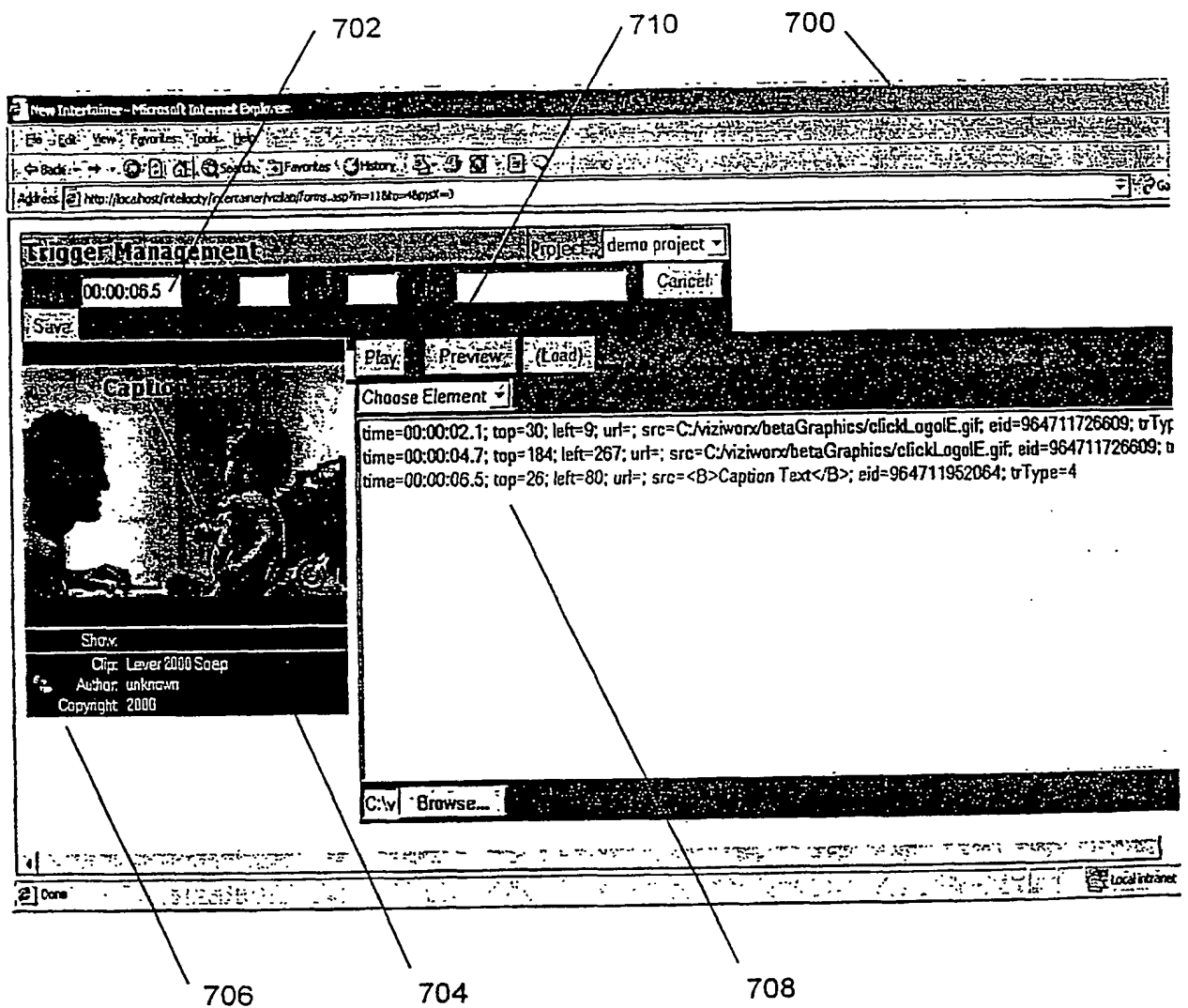
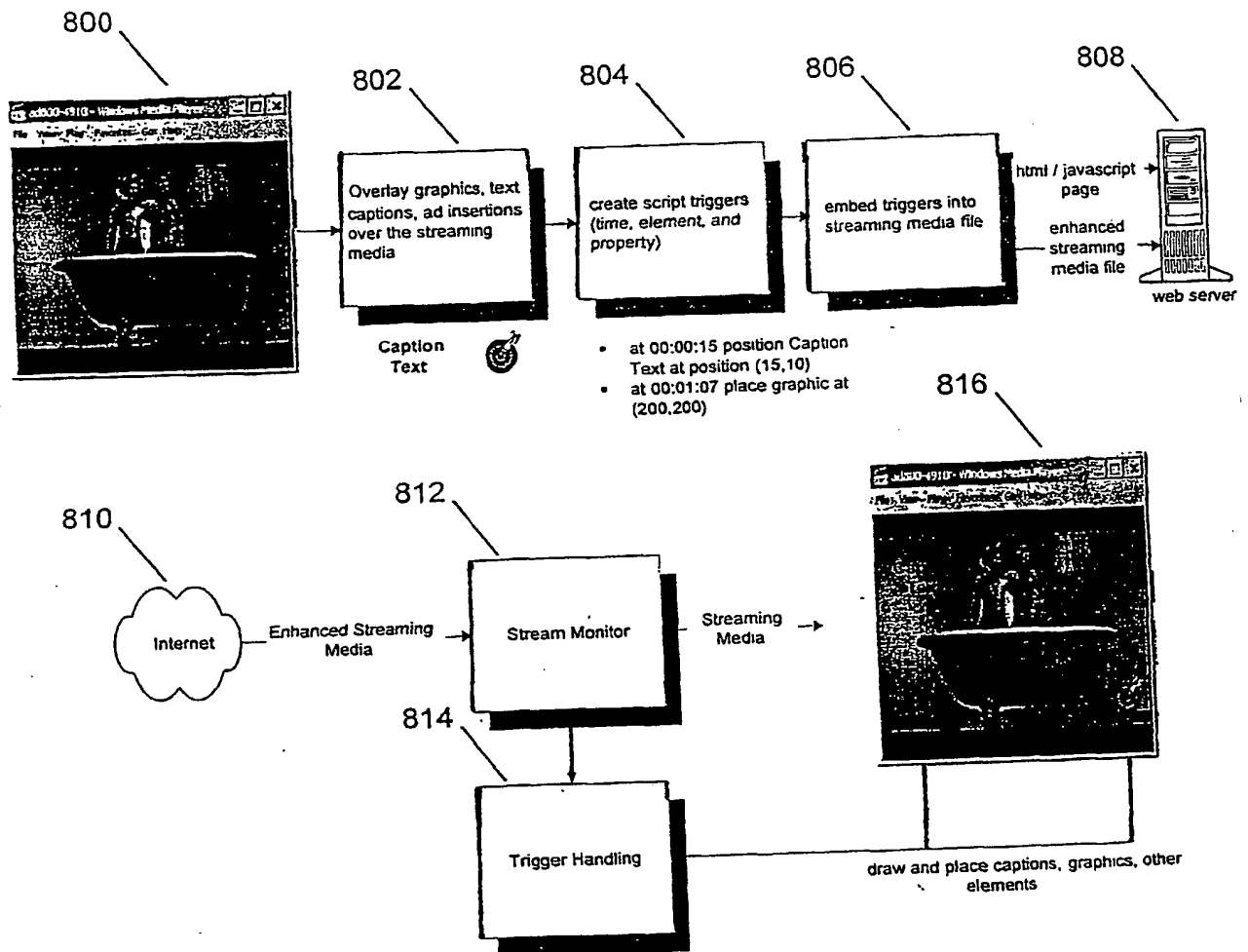


Figure 8



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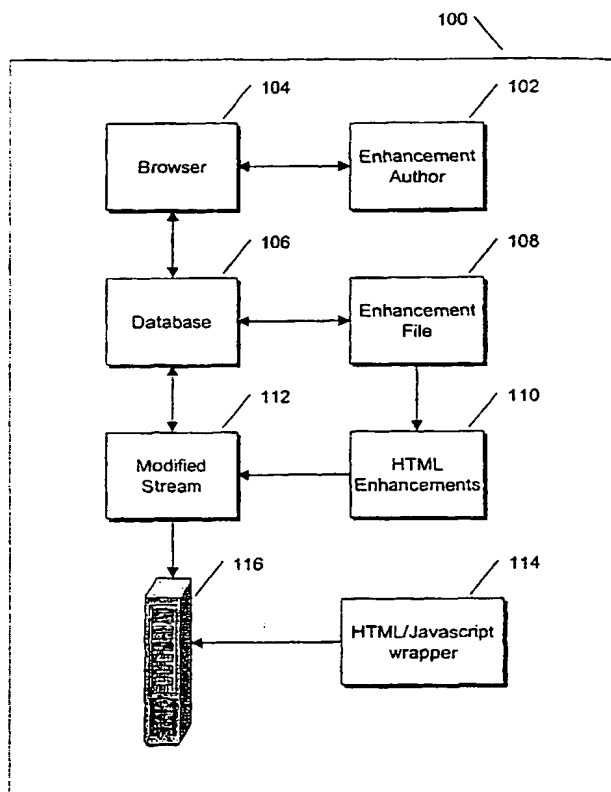
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- (71) Applicant (for all designated States except US): **INTELLICITY USA, INC.** [US/US]; 1400 Market Street, Denver, CO 80202 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **MARKEL, Steven, O.** [US/US]; 3031 E. Wycliff Way, Highlands Ranch, CO 80126 (US).
- (74) Agents: **GALLENSON, Mavis, S. et al.; LADAS & PARRY**, 5670 Wilshire Boulevard, Suite 2100, Los Angeles, CA 90036-5679 (US).
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[Continued on next page]

(54) Title: METHOD AND SYSTEM OF PRODUCING ENHANCED CONTENT TO BE EMPLOYED WITH STREAMING MEDIA



(57) Abstract: A graphical user interface, providing local drag and drop functions, is employed to position text and graphic elements on a video frame image. Frame number, element position, and element attributes are employed to create an enhancement file. The enhancement file is employed to embed a trigger, comprising information that identifies a video frame to be enhanced and a locator indicating where enhancement information may be accessed, into a streaming media file to create an enhanced streaming media file. An HTML/Javascript page embeds a media player and includes software to detect a trigger, access enhancement information, and to render the enhancement information in response to the trigger.

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CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

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INTERNATIONAL SEARCH REPORT

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B. FIELDS SEARCHED

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 96 19779 A (BELL ATLANTIC NETWORK SERVICES) 27 June 1996 (1996-06-27) page 11, line 4 - line 9 page 201 page 11, line 21 - line 22 page 12, line 6 - line 11 page 15, line 7 - line 18 page 15, line 30 - line 35 page 20, line 1 - line 4 page 20, line 13 - line 14 -----	1,10,15, 22
A	"OpenAuthor, Overview, Technical White Paper" OPEN TV, July 1998 (1998-07), XP002090104 the whole document ----- -/--	1,10,15, 22



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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 00 19662 A (RADIOWAVE COM INC) 6 April 2000 (2000-04-06) page 4, line 3 - line 6 ----	1,10,15, 22
A	WO 00 43899 A (HOTV INC) 27 July 2000 (2000-07-27) column 3, line 9 -column 5, line 10 column 5, line 23 -column 6, line 3 ----	1,10,15, 22
A	US 5 708 845 A (WISTENDAHL DOUGLASS A ET AL) 13 January 1998 (1998-01-13) column 7, line 3 - line 36 column 9, line 16 - line 61 ----	1,10,15, 22
A	WATSON: "Scripting the web (Times 2)" 'Online! 30 August 1996 (1996-08-30) XP002197873 Retrieved from the Internet: <URL: http://groups.google.com/groups?q=javascri pt+hypermedia&hl=en&selm=cwatson-300896102 2470001%40204.212.150.108&rnum=7> 'retrieved on 2002-05-02! the whole document ----	1,10,15, 22
E	WO 02 19718 A (IBM UK ;IBM (US)) 7 March 2002 (2002-03-07) page 1, line 1 - line 20 page 2, line 2 - line 5 page 23, line 11 -page 24, line 27 page 25, line 25 - line 27 -----	1,10,15, 22

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/41897

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9619779	A	27-06-1996	US	5659793 A	19-08-1997
			AU	4688996 A	10-07-1996
			WO	9619779 A1	27-06-1996
			US	5826102 A	20-10-1998
WO 0019662	A	06-04-2000	US	6317784 B1	13-11-2001
			AU	6389799 A	17-04-2000
			WO	0019662 A1	06-04-2000
WO 0043899	A	27-07-2000	US	2001023436 A1	20-09-2001
			AU	2857800 A	07-08-2000
			WO	0043899 A1	27-07-2000
US 5708845	A	13-01-1998	CA	2233444 A1	03-04-1997
			DE	69619710 D1	11-04-2002
			EP	0902928 A1	24-03-1999
			JP	11512902 T	02-11-1999
			WO	9712342 A1	03-04-1997
WO 0219718	A	07-03-2002	WO	0219718 A1	07-03-2002

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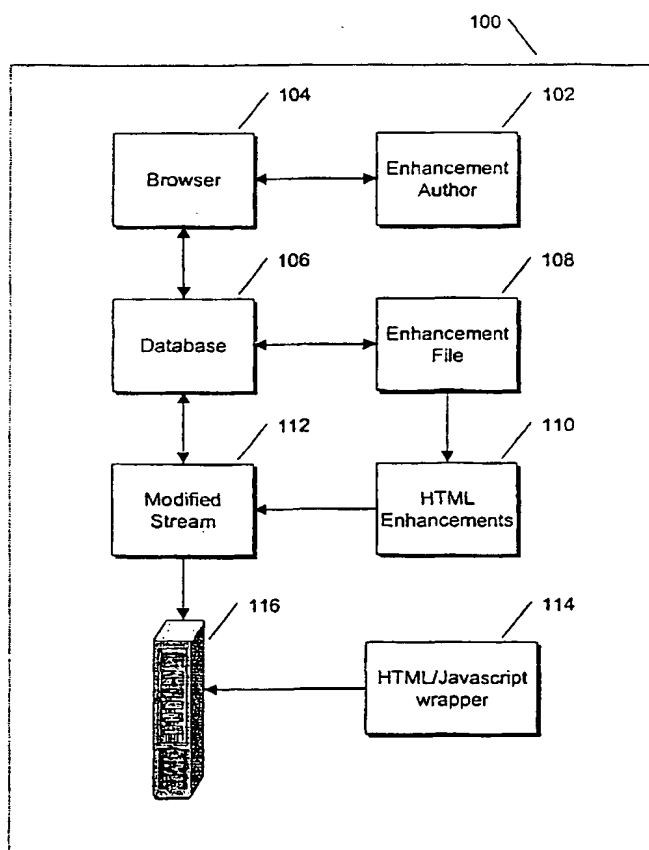
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- (72) Inventor; and
(75) Inventor/Applicant (for US only): MARKEL, Steven, O. [US/US]; 3031 E. Wyecliff Way, Highlands Ranch, CO 80126 (US).
- (74) Agents: GALLENSON, Mavis, S. et al.; LADAS & PARRY, 5670 Wilshire Boulevard, Suite 2100, Los Angeles, CA 90036-5679 (US).

[Continued on next page]

(54) Title: METHOD OF ENHANCING STREAMING MEDIA CONTENT



(57) Abstract: A graphical user interface, providing local drag and drop functions, is employed to position text and graphic elements on a video frame image. Frame number, element position, and element attributes are employed to create an enhancement file. The enhancement file is employed to embed a trigger, comprising information that identifies a video frame to be enhanced and a locator indicating where enhancement information may be accessed, into a streaming media file to create and enhanced streaming media file. An HTML/Javascript page embeds a media player and includes software to detect a trigger, access enhancement information, and to render the enhancement information in response to the trigger.

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(84) **Designated States (regional):** ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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